

In re Patent Application of:  
**CAIN ET AL.**  
Serial No. 10/658,022  
Filing Date: **SEPTEMBER 9, 2003**

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#### REMARKS

The Examiner is thanked for the thorough examination of the present application. As an initial matter, the Examiner objected to the recitation of "at at least one lower protocol layer" in Claims 1 and 25 because "at" occurs twice in a row. However, this is not a typographical error. Instead, these claims are reciting that a controller operates in accordance with a multi-layer protocol including "at least one lower protocol layer," and the noted recitation is specifying that the given operation occurs "at" the at least one lower protocol layer, similar to the other network layer recitations in those claims. As such, Claims 1 and 25 are correct as written, and it is respectfully requested that the objection to these claims be withdrawn.

In view of the foregoing and the arguments presented in detail below, it is submitted that all of the claims are patentable.

#### I. The Claimed Invention

The present invention is directed to a mobile ad hoc network (MANET). As recited in independent Claim 1, for example, the MANET includes a plurality of mobile nodes each including a wireless communications device and a controller connected thereto. The controller operates in accordance with a multi-layer protocol hierarchy. At an application layer, the controller establishes a quality-of-service (QoS) threshold. At a QoS support layer below the application layer, the controller

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determines whether to require data reception acknowledgements based upon the QoS threshold. At a QoS coding layer below the QoS support layer, the controller encodes data from the application layer for transmission to at least one destination mobile node. At a QoS route selection layer below the QoS coding layer, the controller selects at least one route to the at least one destination mobile node based upon the QoS threshold. Moreover, at a QoS traffic layer below the QoS route selection layer, the controller controls data traffic flow based upon the QoS threshold. In addition, at at least one lower protocol layer below the QoS traffic layer, the controller cooperates with the wireless communications device to transmit data to the at least one destination mobile node via the at least one selected route.

Independent Claim 14 is directed to a similar MANET, and independent Claim 25 is directed to a related method for operating a mobile node in a MANET. Each of these claims recites establishing a QoS threshold at an application layer as in Claim 1.

## **II. The Claims Are Patentable**

The Examiner rejected independent Claims 1, 14, and 25 over U.S. Patent No. 6,629,151 to Bahl in view of U.S. Patent No. 6,654,363 to Li et al. Bahl is directed to a wireless LAN system in which network layer interfaces perform static and dynamic queries, as well as requests to set attributes. Li et al. is directed to an Internet protocol (IP) QoS adaptation and management system and method.

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It is respectfully submitted that a selective combination of the above-noted references fails to teach or fairly suggest all of the recitations of the above-noted independent claims. As an initial matter, neither of these references has anything to do with MANETs or performing routing in complex MANET environments. Bahl is directed to querying dynamic aspects of wireless connections in a wireless LAN. An existing wireless LAN typically includes a fixed network with one or more access points connected thereto, and wireless clients or devices access the fixed network via the access points over wireless links. A wireless LAN may have a basic peer-to-peer or "ad hoc" mode, as generally noted at col. 16, lines 6-22 of Bahl. In this mode, wireless devices within range of each other discover and communicate in peer-to-peer fashion without involving central access points.

In contrast, a MANET is a network that is formed of mobile (and potentially stationary) nodes, and is created on the fly as the nodes communicate with each other. The network does not depend on a particular node and dynamically adjusts as some nodes join or others leave the network. As discussed in the background of the present application (see, e.g., paragraphs 0002-0005 of the originally filed specification), because MANETs lack a fixed infrastructure, nodes must self-organize and reconfigure as they move, join or leave the network. All nodes are essentially the same, and there is no natural hierarchy or central controller in the network. All functions may be distributed among the nodes. Nodes are often powered by batteries

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and have limited communication and computation capabilities. Also, the bandwidth of the system is usually limited. The distance between two nodes often exceeds the radio transmission range, and a transmission may have to be relayed by other nodes before reaching its destination. Consequently, a MANET network typically has a multi-hop topology, and this topology changes as the nodes move around.

Thus, while Bahl mentions in passing "ad hoc" operation of an existing wireless LAN, it does not discuss MANETs or performing MANET routing operations as recited in the above-noted independent claims. Moreover, while Li et al. is directed to providing an Internet protocol QoS management mechanism for wireless networks such as CDMA 2000 systems, this reference includes no discussion of implementation of the invention in a MANET.

Furthermore, Bahl also fails to teach establishing a QoS threshold at an application layer as the Examiner contends. In support of this contention, the Examiner simply points to an application layer 100 illustrated in FIG. 2 of Bahl. The only discussion of the function of the application layer 100 provided in Bahl is found at col. 4, lines 27-29, which states that "[t]he application layer 100 directly serves the end user and supports the software applications with which the user interacts." This brief description of the function of the application layer 100 cannot fairly be read to include establishing a QoS threshold as recited in the above noted independent claims.

In view of the above-noted deficiencies, taking all of

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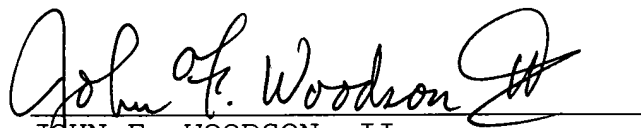
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the teachings of the prior art as a whole, the prior art simply fails to teach or fairly suggest all of the recitations of independent Claims 1, 14, and 25. Accordingly, it is submitted that these claims are patentable over the prior art. Their respective dependent claims, which recite yet further distinguishing features, are also patentable over the prior art and require no further discussion herein.

#### CONCLUSIONS

In view of the foregoing, it is submitted that all of the claims are patentable. Accordingly, a Notice of Allowance is respectfully requested in due course. Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,



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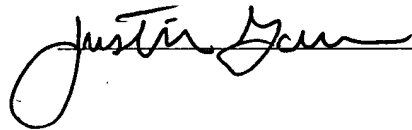
Serial No. 10/658,022

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**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MS Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 23<sup>rd</sup> day of May, 2005.

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